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1958 Agreement:
Consideration of draft amendments to existing UN Regulations submitted by GRPE

Proposal for Supplement 6 to the 06 series of amendments to UN Regulation No. 49 (Compression ignition and positive ignition (LPG and CNG) engines))

Submitted by the Working Party on Pollution and Energy*

The text reproduced below was adopted by the Working Party on Pollution and Energy (GRPE) at its seventy-sixth session (ECE/TRANS/WP.29/GRPE/76, para. 22.). It is based on ECE/TRANS/WP.29/GRPE/2018/10, amended by Annex VI of the session report. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee AC.1 for consideration at their June 2018 sessions.

* In accordance with the programme of work of the Inland Transport Committee for 2018–2019 (ECE/TRANS/274, para. 123 and ECE/TRANS/2018/21, Cluster 3.1), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

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Supplement 6 to the 06 series of amendments to UN Regulation No. 49 (Compression ignition and positive ignition (LPG and CNG) engines))

Paragraph 4.6.2., amend to read:

"4.6.2. If the manufacturer permits the engine family to run on market fuels that do not comply neither with the reference fuels included in Annex 5 nor CEN standard EN 228 (in the case of unleaded petrol) or CEN standard EN 590 (in the case of diesel), such as running on FAME B100 (CEN standard EN14214), FAME diesel blends B20/B30 (CEN standard EN 16709), paraffinic fuel (CEN standard EN 15940) or others the manufacturer shall, in addition to the requirements in paragraph 4.6.1. comply with the following requirements:

(a) Declare the fuels the engine family is capable to run on in paragraph 3.2.2.2.1. of the Information Document as set out in Part 1 of Annex 1, either by reference to an official standard or to a production specification of a brand specific market fuel not meeting any official standard such as those mentioned in paragraph 4.6.2. The manufacturer shall also declare that the functionality of the OBD system is not affected by the use of the declared fuel;

(b) Determine the power correction factor for each fuel declared according to paragraph 9.4.2.8. if applicable according to the provisions specified in paragraph 9.4.2.7. Declare the factor for each fuel in 3.2.2.2.2. of the information document as set out in Part 1 of Annex 1, if applicable;

(c) Demonstrate that the parent engine meets the requirements specified in Annex 4 and in Appendix 1 of Annex 10 to this Regulation on the fuels declared; the approval authority may request that the demonstration requirements be further extended to those laid down in Annex 7 and Annex 9A;

(d) Be liable to meet the requirements of in-service conformity specified in Annex 8 on the fuels declared, including any blend between the declared fuels and the relevant market fuels and standards.

At the request of the manufacturer, the requirements set out in this paragraph shall be applied to fuels used for military purposes.

For the purposes of subparagraph 4.6.2.(a) where the emission tests are performed for demonstrating compliance with the requirements of this Regulation, a fuel analysis report of the test fuel shall be attached to the test report and shall comprise at least the parameters specified in the official specification of the fuel manufacturer."

Paragraphs 9.4.2.5. to 9.4.3.3.1., amend to read:

"9.4.2.5. The average load at each operating condition in Nm calculated from the information requested in paragraph 9.4.2.1. shall not differ from the average measured load at that operating condition by more than:

(a) 7 per cent when determining the engine power according to UN Regulation No. 85;

(b) 10 per cent when performing the World Harmonised Steady state Cycle (hereinafter "WHSC") except for mode 1 and 13 (idle modes) according to Annex 4, paragraph 7.7.

UN Regulation No. 85 allows the actual maximum load of the engine to differ from the reference maximum load by 5 per cent in order to address the manufacturing process variability. This tolerance is taken into account in the above values.

9.4.2.6. External access to the information required in paragraph 9.4.2.1. shall not influence the vehicle emissions or performance.

9.4.2.7. If the difference between the measured torque value obtained with a declared market fuel according to paragraph 4.2.6. and the torque calculated from the information requested in paragraph 9.4.2.1. exceeds one of the values specified in paragraph 9.4.2.5. the following paragraph 9.4.2.8. applies.

9.4.2.8. A power correction factor for each additional market fuel permitted by the manufacturer shall be determined for the engine family. The correction factor shall be calculated as the ratio between average measured peak torque [Nm] on the reference fuel according to Annex 5 and average measured peak torque [Nm] on the market fuel declared.

9.4.3. Verification of the availability and conformity of the ECU information required for in-service testing

9.4.3.1. The availability of the data stream information required in paragraph 9.4.2.1. according to the requirements set out in paragraph 9.4.2.2. shall be demonstrated by using an external OBD scan-tool as described in Annex X.

9.4.3.2. In the case where this information cannot be retrieved in a proper manner, using a scan-tool that is working properly, the engine is considered as non-compliant.

9.4.3.3. The conformity of the ECU torque signal to the general requirements specified in paragraph 9.4.2. shall be demonstrated when determining the engine power according to Annex XIV and when performing the WHSC test according to Annex III.

9.4.3.3.1. The conformity of the ECU torque signal to the requirements of paragraphs 9.4.2. shall be demonstrated for each engine family member when determining the engine power according to UN Regulation No. 85. For this purpose additional measurements shall be performed at several part load and engine speed operating points (for example at the modes of the WHSC and some additional random points). If applicable, the power correction factor for the engine family according to 9.4.2.8. shall be determined with the parent engine of the engine family."

Annex I,

Part I, amend to read:

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3.2.2.	Fuel						
3.2.2.2.	Heavy duty vehicles Diesel/Petrol/LPG/NG-H/NG-L/NG-HL/Ethanol (ED95)/ Ethanol (E85)[1]						

3.2.2.2.1.	Fuels compatible with use by the engine declared by the manufacturer in accordance with paragraph 4.6.2. of this Regulation (as applicable)						
3.2.2.2.2.	Power correction factor according to paragraph 9.4.2.8. for each fuel declared (if applicable)						

"

Annex 8,

Paragraphs 4.4.2. and 4.4.2.1., amend to read:

"4.4.2. Fuel

The test fuel shall be market fuel covered by the relevant standards or reference fuel as specified in Annex 5 to this Regulation.

4.4.2.1. If the manufacturer in accordance with paragraph 4. to this Regulation has declared the capability to meet the requirements of this Regulation on market fuels declared in paragraph 3.2.2.2.1. of Part 1 of Annex 1 to this Regulation, tests shall be conducted on at least one of the declared market fuels."

Insert a new paragraph 4.4.2.2., to read:

"4.4.2.2. Fuel samples shall be taken."

Annex 8

Appendix 1,

Insert a new paragraph A.1.4.2.1.1., to read:

"A.1.4.2.1.1. Calculation of the specific emissions for a declared market fuel

If a test according to this Annex was performed with a market fuel declared in paragraph 3.2.2.2.1. of Part 1 of Annex 1 to this Regulation and a power correction factor in accordance with paragraph 3.2.2.2.2. of Part 1 of Annex 1 to this Regulation was documented for the market fuel used for the test, the specific emissions e_{gas} (mg/kWh) shall be calculated for each window and each pollutant by multiplication of the specific emissions with the declared power correction factor.

Appendix 4,

Insert a new paragraph A.4.2.1.1., to read:

"A.4.2.1.1. If a market fuel declared in paragraph 3.2.2.2.1. of Part 1 of Annex 1 to this Regulation is used and a power correction factor in accordance with paragraph 3.2.2.2.2. of Part 1 of Annex 1 to this Regulation was documented for the dedicated market fuel used for the test, the ECU torque signal has to be multiplied by the inverted correction factor prior to the verification with the reference maximum torque curve performed with this specific market fuel."